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figures. Unfortunately Mr. Distant, in describing the new genera and species, scarcely ever makes any comparisons with their allies. The same criticism may be made of many of Mr. Fletcher's descriptions of Seychelles Lepidoptera, and of numerous other recent publications of new species of insects. If the species or genera described have been ascertained to be new, they must have been compared with their relatives, and there seems to be no excuse for omitting information on this point, which would be of so much service to subsequent workers. Mr. Fletcher's long and elaborate account of the Lepidoptera brings out a number of interesting facts. For the Seychelles proper he enumerates 120 species, of which only 17 appear to be precinctive. Putting aside the widely-spread forms, the specially Indian element is very small; the African is distinctly greater. Among the butterflies, only a single species (*Parnara morella*) is peculiar to the Seychelles; two others are confined to Aldabra and the Seychelles. In a brief account of the Lepidoptera of the Chagos Archipelago 26 species are enumerated, three being precinctive. One butterfly (*Junonia vellida*) is Australian, and is supposed to have arrived by way of Christmas Island.

T. D. A. COCKERELL

THE GEOGRAPHY OF FERNS

THE venerable pteridologist, Christ, in the course of a long and exhaustive study has accumulated a wealth of fern information not directly usable in taxonomic publications, which he has lately brought together in a separate volume.¹ His treatment comprises separate analyses of environmental and geographic considerations.

Though of an ancient line of descent with a fairly large persistence of Tertiary or earlier types, and comprising a rather insignificant fraction (considerably less than 10,000 species) of the present vascular flora of the world, the ferns are found to follow the same distri-

butional laws as the more modern and now dominant seed plants and to show similar endemic centers. Though on the one hand tolerant of extreme precipitation, and on the other presenting some of the most marked examples of xerophytic dormancy, they appear to have been in the main less pliable than the seed plants. Few grow where the annual rainfall is less than 25 inches and their lateral and vertical distribution in general agrees with that of forests, their greatest occurrence being coincident with that of the tropical forests under a rainfall of 80 inches or more per year; one only is aquatic, and only two or three are halophytes. In adaptive form they ring nearly all the changes from minute epiphytic or terrestrial herbs to lianas, climbers and trees; and slime protection, nectar secretion, myrmecophily, food and water storage and numerous and varied provisions against drought, parallel those of the spermatophytes. The chief areas differentiated by their floras are: the cool-temperate northern forest regions, the Mediterranean region, China-Japan, Malaya, Australia-New Zealand, tropical Africa, south Africa, the Mexican table-land, tropical America, the south Brazilian campos, the Andes, and the south-Chilean region.

Though sometimes separated from the explanatory text, the many original half-tone illustrations of form and habit add much to the attractiveness and usefulness of what must be regarded as at once an unusual and a valuable contribution to botanical literature—the richness of which in specific information is indicated by a three-column index of over fourteen pages, devoted to the forms mentioned in the text.

W. T.

An Outline of Individual Study. By G. E. PARTRIDGE, Ph.D. New York, Sturgis & Walton. 1910. Pp. v + 240.

This book is intended as a guide for those who wish to engage in the study of individuals. The author believes that it will be of value to superintendents and teachers and that such study might well supplement if not take the place of general psychology in normal schools.

¹ H. Christ, "Die Geographie der Farne," Jena, Verlag von Gustav Fischer, 1910, 8vo, pp. 357, figs. 130, maps 3. Price 12 Marks.

It treats of the nature of individuality, of individual study as a science, the various standpoints for studying individuals, anthropological, biological, etc., and gives many suggestions and directions regarding the study of general physical and mental characteristics of individuals, with special directions and outlines for studying health, growth, movement, emotions, interests, instincts, perception, memory, etc. One chapter is devoted to an original study of two twins and the book closes with a discussion of types of individuality and the pedagogical aspects of individuality. At the close of each topic is given a very serviceable list of references.

The book does not profess to be scientific in the sense of outlining methods for scientific research or summarizing the results of research, but it is scientific in the sense that the author outlines the experiments and observations in accordance with scientific principles such as he and others have used, though he does not usually give detailed descriptions of experiments. In fact, although he wishes to help the teacher, he reveals the fact that his own interest is in determining what is scientifically true, rather than in simply finding out the facts that may guide one in dealing with the individual in question. Such an attitude may, however, be a good thing to maintain before teachers who are perhaps inclined to be rather narrow in their interests and hasty in reaching conclusions.

There is no question that there is a growing demand on the part of teachers of psychology for some simple means of testing individuality and an increasing recognition on the part of superintendents and teachers of the need of some means other than the usual school tests for diagnosing the condition of individual pupils, in order that they may be placed in special classes when necessary or may receive the individual help that they need. It is entirely too much to expect, in this stage of experimental psychology and pedagogy when a committee of the American Psychological Association have been laboring without complete success for several years upon a series of standard tests, that this pioneer book in the

field should be satisfactory in every particular. The book is, however, a very creditable attempt at making the methods now being used in the scientific study of man useful to the student of psychology and pedagogy. Detailed criticism would take too much space and be of little value because at the present time probably no two persons would agree as to what should or should not be included in such a book.

E. A. KIRKPATRICK

FITCHBURG, MASS.

Tent Life in Siberia. Adventures among the Koraks and other tribes in Kamchatka and northern Asia. By GEORGE KENNAN. New York, G. P. Putnam's Sons. Pp. xix + 482. 8vo. 32 illustrations and maps. 1910.

Forty years ago, when, from the recent purchase of Alaska, public interest in the north Pacific region was still keen, a little volume by a member of the Russo-American Telegraph expedition detailing his experiences in connection with their explorations in eastern Siberia was offered to the public. Its graphic descriptions of conditions in an almost unknown part of the world, and its careful portrayal of the natives and their mode of life, made it a welcome contribution to geography and anthropology, while the charm of its style captivated the reader.

To these qualifications, doubtless, is due the fact, that without newspaper advertising or exploitation, the book has continued to be in demand until the original plates have been worn out. Now the publishers have given us a new edition with additions by the author and illustrated by excellent half tones taken from photographs obtained in the same region by the Jesup Expedition.

Conditions in this remote region have hardly altered since Kennan's time. For a popular account in untechnical language by a reliable observer the book remains unique in English literature, and well worthy of its new and attractive form.

The careful reader may avoid some bewilderment by noting that on the legend of the map the symbols for the proposed tele-

graph line and for Kennan's actual route have been interchanged.

WM. H. DALL

SOCIETIES AND ACADEMIES

THE CHEMICAL SOCIETY OF WASHINGTON

A SPECIAL meeting of the society was held on Saturday evening, May 21, at the Johns Hopkins University. Vice-president Skinner called the meeting to order and asked Professor Acree to preside. After a few words of welcome from President Ira Remsen, the following papers were presented:

Temperature Coefficients of Osmotic Pressure:
Professor H. N. MORSE.

The report was upon the work of the last two years, during which the temperature coefficient of osmotic pressure has been under investigation. It was shown that in the case of cane sugar solutions ranging in concentration from 0.1 to 1.0 weight-normal—the ratio of osmotic pressure to calculated gas pressure is constant for any given concentration of solution, between 0° and 25°. In other words, that within these limits of concentration and temperature the osmotic pressure of cane sugar solutions obeys the law of Gay-Lussac for gases.

The Relation between Commerce and Scientific and Technical Work: DR. H. F. BAKER.

Recent Work on the Absorption Spectra of Solutions: DR. W. W. STRONG.

The absorption spectra of uranyl salts in solution consists of a series of about ten bands running from $\lambda 5000$ to $\lambda 3200$. Uranous salts have an entirely different absorption spectra, including bands in the red, yellow and green. It is quite difficult in some cases to obtain the uranous solutions entirely free of the uranyl salts, so that the uranyl bands will appear in the absorption spectra. But by adding hydrogen peroxide and photographing the absorption spectra as the uranous salt is gradually oxidized to the uranyl salt, it is quite easy to differentiate between the uranyl and uranous bands.

It has been found that the absorption spectra in different solvents are very different. As the solvent is gradually changed the uranous bands of one solvent gradually disappear while those of the solvent which is increasing in amount increase in intensity. The wave-lengths of these bands do not change. On the other hand, when the solvent is kept the same and one uranyl or uranous salt is changed into another salt by the addition of

acid, the uranyl and uranous bands in general are shifted.

Fractionation of Crude Petroleum by Diffusion through Fuller's Earth: DR. J. E. GILPIN.

Evidence was presented in favor of the view that one cause, at least, of the differences in petroleum from different localities is due to the degree and nature of the capillary filtration to which they are subjected in passing from their place of origin to the place where they are found.

After the meeting the society adjourned to the Johns Hopkins Club, where a smoker was held. The attendance at the meeting was sixty-two.

J. A. LECLERC,
Secretary

THE GEOLOGICAL SOCIETY OF WASHINGTON

At the 231st meeting of the society, held on Wednesday, April 13, 1910, the following papers were read:

Regular Program

Solution and Cementation in Arid Regions: E. E. FREE.

Through soils and other unconsolidated surface deposits there is normally a double movement of water: downward percolation during or following rain, and upward rise by capillarity during periods of surface dryness. In the humid regions the downward percolation is far in excess and the various substances dissolved by the waters from the soil minerals are carried away into the drainage. The soil is subjected to leaching and retains no soluble materials except those held chemically or physically (as *e. g.*, by adsorption) in or on the solid particles of the soil. With decreasing rainfall the relative importance of the downward percolation decreases while that of the capillary rise increases. Under moderate aridity (semi-arid conditions) there is still a net downward flow, but it is insufficient to fully leach the soil and there is a tendency for the accumulation of the less soluble materials (usually lime carbonate) in the subsoil. Thus are formed the well-known lime-cemented subsoils, the "whitewash," etc., of the southwestern United States. The exact process of formation of the so-called "caliche" (the lime caliche—not the sodium salt caliche of South America), "tepetate," etc., is uncertain, but is probably similar. Under extreme aridity there is on many types of soil practically no final downward movement of water. The entire rainfall is stored in the subsurface layers and returned